UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. L8228

TWP NO. 31

OVER THE

SOUTH BRANCH OF THE BUFFALO RIVER

DISTRICT 4 - CLAY COUNTY

PREPARED FOR THE

MINNESOTA DEPARTMENT OF TRANSPORTATION

BY

COLLINS ENGINEERS, INC.

JOB NO. 3512 (CEI 49)

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The substructure units inspected at Bridge No. L8228, the West Abutment and Piers 1 and 2, were in good condition with no defects of structural significance observed. The timber piles of the substructure units were in good condition with no instances of excessive decay. Random splitting at the connections was observed in the diagonal bracing. A heavy accumulation of timber debris was observed across the entire upstream fascia of the bridge, and extended upstream of the bridge by 50 to 100 feet.

INSPECTION FINDINGS:

(A) The diagonal timber braces were split through the connections at several locations at both piers. The splitting in the connections measured up to 2 inches wide by 8 feet in length. A diagonal brace at the south end of Pier 1 exhibited weathering and decay with a 40 percent loss of section.

(B) A very heavy timber debris accumulation was observed across the entire channel width at the upstream (south) fascia of the bridge. The timber debris extended 50 to 100 feet upstream, continued through the center span, and extended to the downstream fascia. The debris consisted primarily of branches and trees up to 3 feet in diameter. The amount of debris and the potential for excessive lateral leads during high water and flow conditions is considerable.

RECOMMENDATIONS:

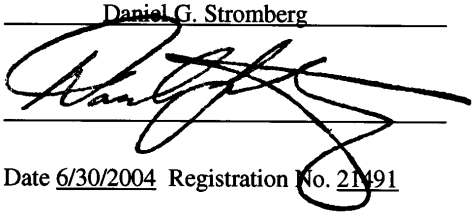
(A) Remove the heavy accumulation of timber debris from around structure to eliminate the potential for continued accumulation, scour influence, and excessive lateral loads on bridge.

(B) Repair/replace the split and decayed timber braces to restore lateral stability to the piers.

(C) Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years.

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

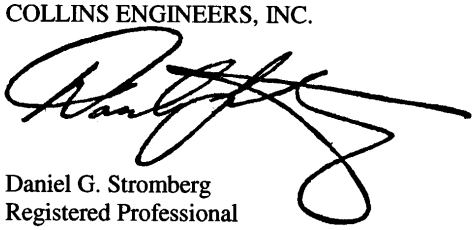
Daniel G. Stromberg



Date 6/30/2004 Registration No. 21491

Respectfully submitted,

COLLINS ENGINEERS, INC.



Daniel G. Stromberg
Registered Professional
Engineer, State of Minnesota

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

1. BRIDGE DATA

Bridge Number: L8228

Feature Crossed: The South Branch of the Buffalo River

Feature Carried: TWP No. 31

Location: District 4 - Clay County

Bridge Description: The superstructure consists of three timber beam spans. The substructure consists of two timber pile abutments and two timber pile piers. The piers are numbered 1 and 2 starting from the west end of the bridge.

2. INSPECTION DATA

Professional Engineer/ Team Leader: Shirley M. Walker, P.E.

Dive Team: Clayton G. Brookins, Michelle D. Koerbel

Date: October 29, 2002

Weather Conditions: Rain and Snow, " 35E F

Underwater Visibility: " 1 Foot

Waterway Velocity: Negligible/None

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Piers 1 and 2, and the West Abutment.

General Shape: The piers consist of five vertical timber piles supporting a timber pile cap. The abutments consist of five vertical timber piles supporting a timber pile cap and timber lagging with adjacent timber pile and planking wingwalls.

Maximum Water Depth at Substructure Inspected: Approximately 3.1 Feet.

4. WATERLINE DATUM

Water Level Reference: The top of the timber curb at the south end of Pier 1.

Water Surface: The waterline was approximately 9.0 feet below reference.
Assumed Waterline Elevation = 91.0.

5. NBIS CODING INFORMATION (Minnesota specific codes are used for 92B and 113)

Item 60: Substructure: Code 7

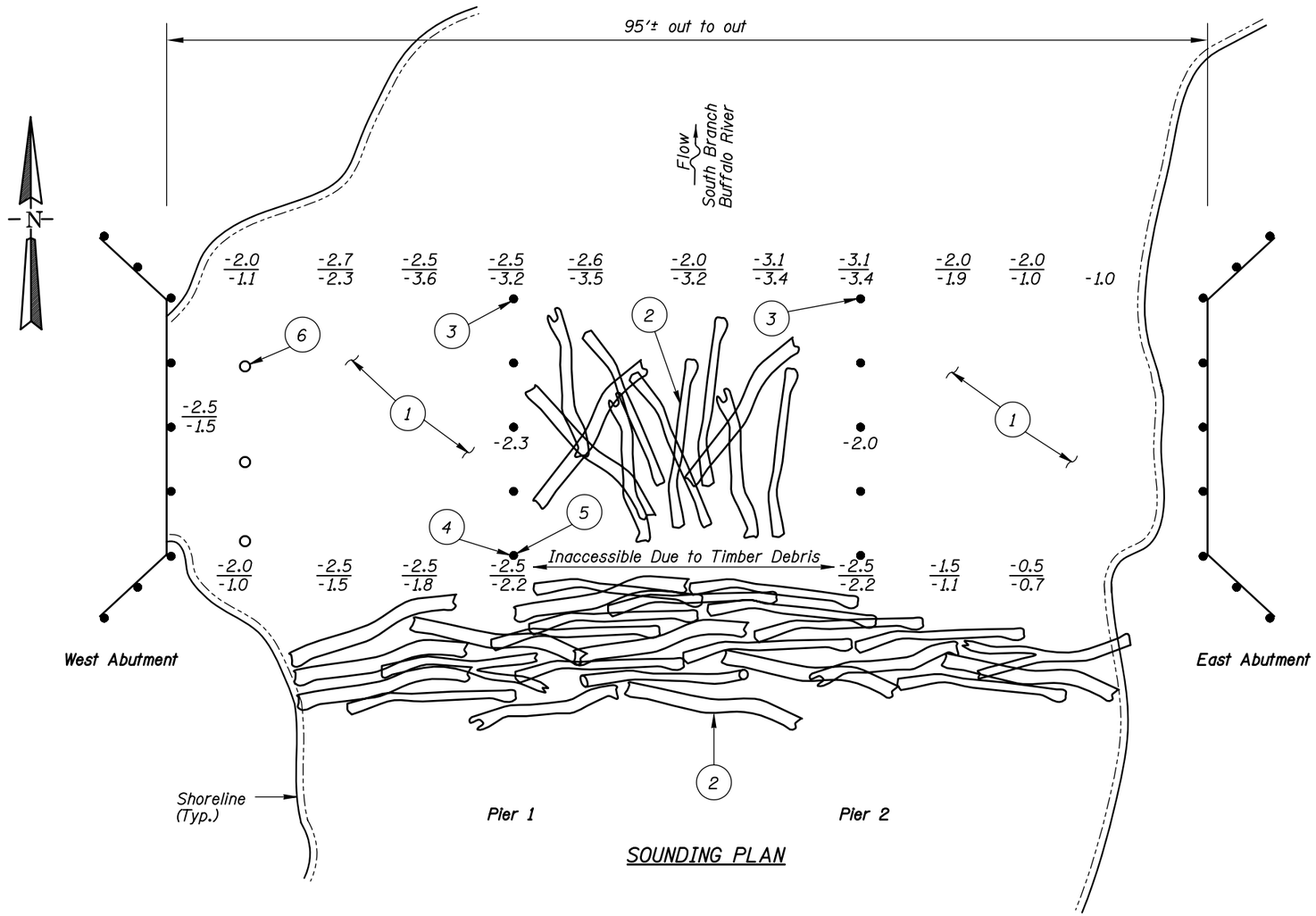
Item 61: Channel and Channel Protection: Code 4

Item 92B: Underwater Inspection: Code B/10/02

Item 113: Scour Critical Bridges: Code I/95

Bridge is scour critical because abutment or pier foundation is rated as unstable due to observed scour at bridge site.

_____ Yes __X__ No



SOUNDING PLAN

TYPICAL END VIEW OF PIERS

GENERAL NOTES:

1. The West Abutment, and Piers 1 and 2 were inspected underwater.
2. At the time of inspection on October 29, 2002, the waterline was located approximately 9.0 feet below the top of the timber curb at the upstream end of Pier 1. Since insufficient bridge elevation information was available a reference elevation of 100.0 was assumed. Based on the assumed reference the waterline elevation was 91.0.
3. Soundings indicate the water depth at the time of inspection and are measured in feet.
4. Soundings were taken parallel to the bridge at 1/4 point intervals between the substructure units.

INSPECTION NOTES:

(1) The channel bottom consisted of matted small branches and twigs and silt with up to 1 foot of probe rod penetration.

(2) Very heavy accumulations of timber debris were observed across the entire channel width from the upstream fascia and extended 50 to 100 feet upstream of the bridge. Timber debris also continued through the the center span and extended to the downstream fascia. The timber debris consisted of branches and trees up to 3 feet in dimeter.

(3) The diagonal bracing was split at the connection below the waterline, measuring 2 inches wide by 8 feet long maximum.

(4) The diagonal bracing was split at the pile cap connection, measuring 1 inch wide by 4 feet long.

(5) The diagonal bracing was weathered and decayed for a length of 6 feet and exhibited 40 percent section loss.

(6) Old cut off piles were observed protruding from the channel bottom. (Typical)

Legend

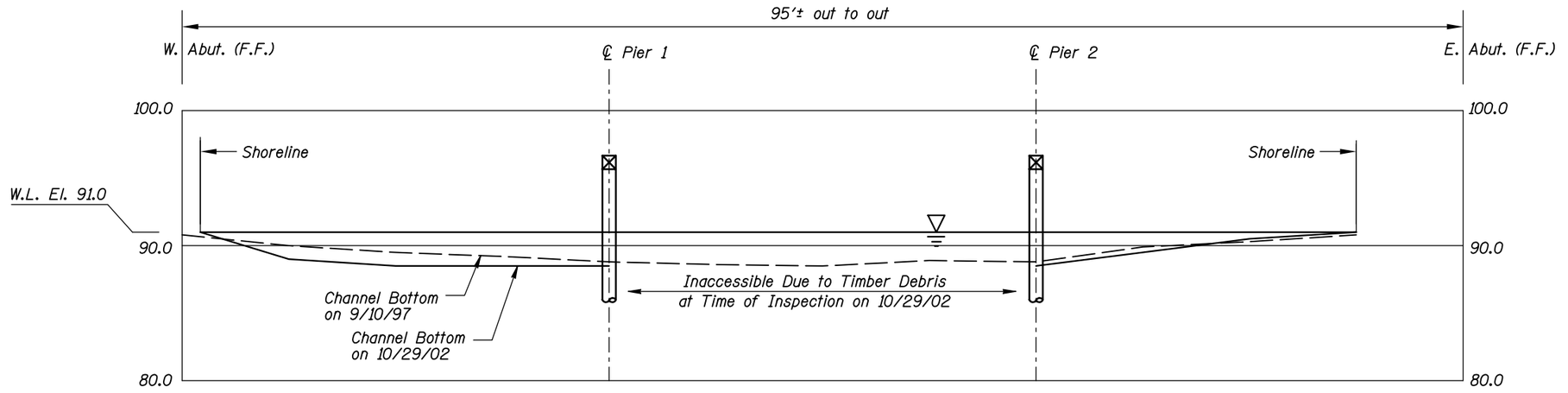
-2.0 / -5.2	Sounding Depth from Waterline (10/29/02) / Sounding Depth from Waterline (9/10/97)
●	Timber Pile
○	Cut Off Timber Pile
	Timber Debris

MINNESOTA
DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

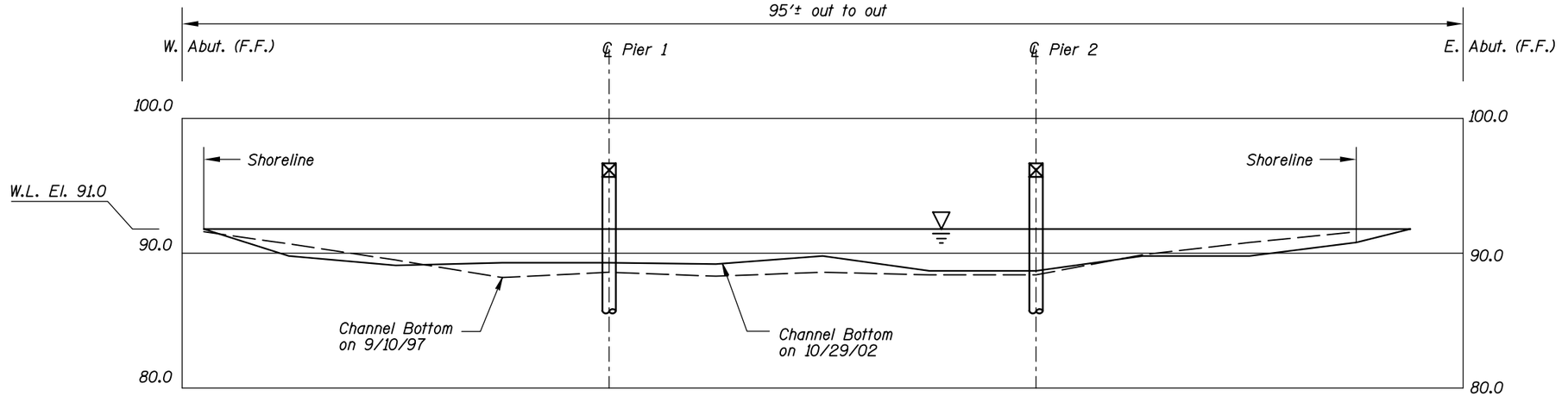
STRUCTURE NO. L8228
OVER THE SOUTH BRANCH OF THE BUFFALO RIVER
DISTRICT 4, CLAY COUNTY, GLYNDON TOWNSHIP

INSPECTION AND SOUNDING PLAN

Drawn By: PRH	COLLINS ENGINEERS, INC.	Date: OCT. 2002
Checked By: MDK	300 W. WASHINGTON, STE. 600 CHICAGO, ILLINOIS 60606 (312) 704-9300	Scale: NTS
Code: 35120049		Figure No.: 1



UPSTREAM FASCIA PROFILE
Vertical Scale: 1"=10'-0"



DOWNSTREAM FASCIA PROFILE
Vertical Scale: 1"=10'-0"

Note:

Refer to Figure 1 for General Notes.

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DISTRICT 4, CLAY COUNTY, GLYNDON TOWNSHIP

UPSTREAM AND DOWNSTREAM FASCIA PROFILES

Drawn By: PRH	COLLINS ENGINEERS, INC.	Date: OCT. 2002
Checked By: MDK	6458 CITY WEST PARKWAY, STE. 100 EDEN PRAIRIE, MINNESOTA 55344 (612) 941-0327	Scale: NTS (U.O.N.)
Code: 35120049		Figure No.: 2

Photograph 1. Overall View of the Structure, Looking Northwest. Note Heavy Timber Debris Accumulation.

Photograph 2. View of Pier 1, Looking Southeast.

Photograph 3. View of Pier 2, Looking Northwest.

Photograph 4. View of West Abutment, Looking South.

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES
DAILY DIVING REPORT

INSPECTORS: Collins Engineers, Inc. DATE: October 29, 2002
ON-SITE TEAM LEADER: Shirley M. Walker, P.E.
BRIDGE NO: L8228 WEATHER: Rain/Snow, "35E F
WATERWAY CROSSED: The South Branch of the Buffalo River
DIVING OPERATION: X SCUBA SURFACE SUPPLIED AIR
OTHER
PERSONNEL: Clayton G. Brookins, Michelle D. Koerbel
EQUIPMENT: Scuba, U/W Light, Scraper, Sounding Pole, Lead Line, Probe Rod, Camera
TIME IN WATER: 11:20 A.M.
TIME OUT OF WATER: 11:35 A.M.
WATERWAY DATA: VELOCITY Negligible/None
VISIBILITY "1 foot
DEPTH 3.1 feet maximum at Pier 1
ELEMENTS INSPECTED: The West Abutment, and Piers 1 and 2.
REMARKS: The timber piles of the substructure units inspected were found to be in good condition with no defects of structural significance observed. Two of the diagonal timber braces were split at their pile connections. One diagonal brace exhibited 40 percent loss of section. There was a very heavy timber debris accumulation along the upstream (south) fascia of the bridge, extending up to 100 feet upstream of the bridge. The overall amount of drift is considerable, and with high probability could increase lateral loads to the bridge during high flow conditions and should be removed as soon as possible.

FURTHER ACTION NEEDED: ___X___ YES _____ NO

Remove the heavy accumulation of timber debris from structure to eliminate the potential for continued accumulation, scour influence, and excessive lateral loads on bridge.

Repair/replace the split and decayed timber braces to restore lateral stability to the piers.

Reinspect the submerged substructure units at the normal maximum recommended interval of five (5) years.

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES

UNDERWATER INSPECTION CONDITION RATING FORM

BRIDGE NO. L8228
INSPECTORS Collins Engineers, Inc.
ON-SITE TEAM LEADER Shirley M. Walker, P.E.
WATERWAY CROSSED The South Branch of the Buffalo River

INSPECTION DATE October 29, 2002

NOTE: USE ALL APPLICABLE CONDITION DEFINITIONS AS DEFINED IN THE MINNESOTA RECORDING AND CODING GUIDE INCLUDING GENERAL, SUBSTRUCTURE, CHANNEL AND PROTECTION, AND CULVERTS AND WALL DEFINITIONS TO COMPLETE THIS FORM.

CONDITION RATING

			SUBSTRUCTURE						CHANNEL					GENERAL					
UNIT REFERENCE NO.		MAXIMUM DEPTH OF WATER	PILING	COLUMNS, SHAFTS, OR FACES*	FOOTINGS	DISPLACEMENT	OTHER (BRACING)	OVERALL SUBSTRUCTURE CONDITION CODE*	SCOUR	EMBANKMENT EROSION	EMBANKMENT PROTECTION	OTHER (DRIFT/DEBRIS)	OVERALL CHANNEL & PROTECTION CONDITION	CONCRETE	STEEL	TIMBER	LOSS OF SECTION	PREVIOUS REPAIR OR MAINTENANCE	OTHER
	UNIT DESCRIPTION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	West Abutment	2.5’	N	7	N	9	N	7	8	7	6	4	4	N	N	7	7	N	N
	Pier 1	2.5’	N	7	N	9	6	7	8	N	N	4	4	N	N	7	7	N	N
	Pier 2	3.1	N	7	N	9	6	7	8	N	N	4	4	N	N	7	7	N	N

*UNDERWATER PORTION ONLY

REMARKS: The timber piles of the substructure units inspected were found to be in good condition with no defects of structural significance observed. Two of the diagonal timber braces were split at their pile connections. One diagonal brace exhibited 40 percent loss of section. There was a very heavy timber debris accumulation along the upstream (south) fascia of the bridge, extending up to 100 feet upstream of the bridge. The overall amount of drift is considerable, and with high probability could increase lateral loads to the bridge during high flow conditions and should be removed as soon as possible.

NOTES: ATTACH SKETCHES AS NEEDED, IDENTIFY REMARK BY REFERRING TO UNIT REFERENCE NO. AND REMARK NO.
USE GENERAL SECTION TO IDENTIFY OVERALL PRESENCE OF SPALLS, CRACKS, CORROSION, ETC.